

Food and feeding mode of Thysanodontinae (Mollusca: Gastropoda: Calliostomatidae)

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Abstract

Thysanodontinae are reported to feed on Stylasteridae (Cnidaria: Hydroida).

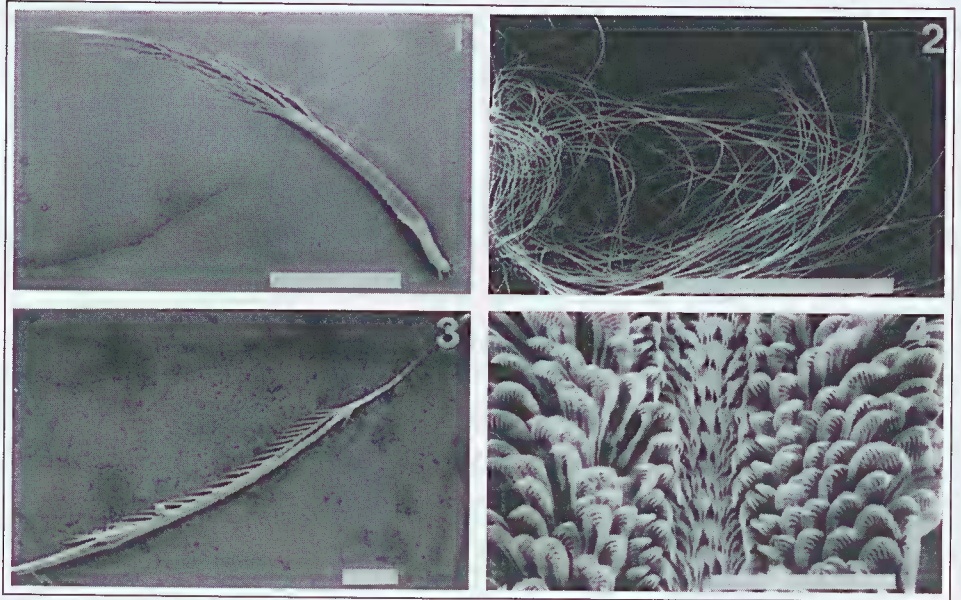
Key words: Mollusca, Calliostomatidae, Thysanodontinae, Cnidaria, Stylasteridae.

Introduction

Thysanodontinae was introduced for a group of species with a bizarre radular morphology unique among Trochoidea. It was originally interpreted as a subfamily of Trochidae related to Calliostomatinae (Marshall, 1988), later (Marshall, 1995a, b) as a subfamily of Calliostomatidae (Trochoidea). At about 2.4 μm wide and 1.10 - 3.40 mm long, the moderately flexible, hair-like radular teeth are the most slender of any known mollusc, each having a long, finely tapered tip, behind which is a series of fine, backwardly inclined barbs (Figs 1-3). All other calliostomatids (Calliostomatinae) have radulae that are variations on a standard rhipidoglossate radular plan, with short central and lateral teeth and slender outer marginal teeth, the stouter innermost marginals being the main food cutting teeth (Marshall, 1995b) (Fig. 4). All calliostomatines are carnivores, the majority feeding on thecate hydroids (Leptomedusae), anemones and scleractinean corals (Anthozoa) (Ferro and Cretella, 1993; Marshall, 1988 and references therein). A few species feed exclusively on sponges (Porifera), whereas others have been observed eating carrion (Marshall, 1988, 1995b). Since thysanodontine teeth pack the anterior alimentary tract and were clearly unsuited for food preparation and gathering work of the types performed by other rhipidoglossate gastropods, I originally concluded that the food had to be fluid, perhaps liquified by proteolytic enzyme, and that the radula might be used to penetrate and process soft-bodied prey with a push/pull action (Marshall, 1988).

Associations

There are three positive associations and a deduced association with living Stylasteridae (Cnidaria: Hydroida) from within the New Zealand region. The data are as follows: (1) three living adult specimens of *Thysanodonta wairua* Marshall, 1988, deeply entangled among branches of a large colony of living *Errina* sp. from off Three Kings Islands (craypot, c. 100 m; Burch collection, Whangarei); (2) one adult specimen of *Carinastele kristelleae* Marshall, 1988, taken alive from a living colony of *Errina novaezelandiae* Hickson, 1912, from unnamed rock off the north end of Cording Island, Preservation Inlet, Fiordland (25 m,



Figures 1-4.

1. Almost entire radula (minus a few teeth) of holotype of *Carinastele kristelleae* Marshall, 1988, Cook Strait, New Zealand, 256-274 m.
2. Tangle of teeth from radula of paratype of *Thysanodonta eucosmia* Marshall, 1995, off southern New Caledonia, 470 m.
3. Tip of single radular tooth of holotype of *Thysanodonta aucklandica* Marshall, 1988, off Auckland Islands, New Zealand, 549 m.
4. Almost full width of section of radula of *Calliostoma tricolor* Gabb, 1865, off San Diego, California, 55 m.

Scale bars 1, 2 = 1000 μm , 3 = 20 μm , 4 = 500 μm .

scuba, A. Penniket, February 1995; Museum of New Zealand, Wellington, NMNZ M.131454); (3) 12 adult specimens of *Carinastele kristelleae* taken alive from living colonies of *Errina novaezelandiae*, from opposite Adam Head, Long Sound, Preservation Inlet, Fiordland (15-18 m, 18 August 1996, scuba, C.D. Paulin; NMNZ M.131683); (4) one live specimen and four shells of *Carinastele kristelleae* dredged from a hard, current-scoured substratum with common live colonies of *Errina cooki* Hickson, 1912, Cook Strait narrows (256-274 m, 29 September 1976; NMNZ M.55026, M.80705).

Numerous specimens of several thysanodontines have been dredged off southern New Caledonia (Marshall, 1995b; additional material Muséum National d'Histoire Naturelle, Paris) together with rich stylasterid faunas and other associated biota (P. Bouchet, pers. comm.). Herbert (1995) suggested that specimens of the southern African species *Herbertina hayesi* Herbert, 1995 taken alive from crayfish traps may have been attracted to fish used as bait. Although we cannot preclude this possibility, they may well have been brought to the surface entangled in stylasterids, which are common in the area (D.G. Herbert, pers. comm.), or other residue.

Conclusion

Presumably thysanodontines feed on stylasterid tissues, which they reach by thrusting the clustered radular teeth deep into individual gastropores (none of which exceed 280 μm width in the associated *Errina* species).

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